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RE: Phosphorus Reduction in Aqueous Streams  
APPLICATION NO.: 09/898,437  
APPEAL NO.: 2003-0746  
OUR FILE NO. CH2814 US NA

CC:

Number of pages including cover sheet: 10

**Message:**

Please see attached Request for Rehearing.

LKS

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Request for Rehearing

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Patent

#18  
6/30/03  
DmIN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In the Application of:

Robert H. Moffett

SERIAL NO.: 09/898,437

APPEAL NO: 2003-0746

FILED: 07/03/2001

FOR: Phosphorus Reduction in Aqueous Streams

CASE NO.: CH2814 US NA

GROUP ART UNIT: 1724

EXAMINER: Peter Hruskoci

REQUEST FOR REHEARINGCommissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450BOARD OF PATENT  
APPEALS &  
INTERFERENCES  
JUN 27 2003

Sir:

Appellant requests the Board to reconsider the following points which appellant submits to be misapprehended or overlooked in the decision mailed May 14, 2003.

Point 1

On page 5, first full paragraph, the decision referring to appellant's Reply Brief, states that the Board finds no merit in arguing that Allgulin does **not** suggest adding a flocculant to precipitate phosphorus . . . . The Board reasoned that the appealed claims simply call for removing phosphorus from an aqueous stream . . . and do not specify that the inorganic colloid and organic polymer perform precipitation function (decision, page 5, lines 12-19; *Italics appellant's*). Appellant submits that the Board misconstrued the claims.

Claim 1 noted on page 1 of the decision, specifically calls for a process to remove phosphorus . . . , comprising . . . ; (b) adding one or more metal ions . . . ; (c) adding an anionic inorganic colloid . . . ; and (d) adding an organic polymer . . . , to *produce a flocculated mass* (emphasis added).

Similarly, claim 5, as noted by the Board on page 2 of the decision, specifically calls for a process to remove phosphorus . . . , comprising . . . ; (b) adding one or

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more metal ions . . . ; (c) adding at least one cationic organic polymer . . . ; and (d) adding at least one anionic organic polymer . . . to produce a flocculated mass (emphasis added).

Contrary to the Board's reasoning, both claims require the limitation of producing flocculated mass by addition of at least one polymer flocculants to perform a precipitation function. The primary reference, Allgulin, however, as noted by the Board on page 5 in the beginning of the full paragraph, *the flocculant is added to aid in removal of the precipitate in the lamella, not to precipitate phosphorus* (Italics original). As the Board already noted in the decision, phosphorus in Allgulin is precipitated upon the addition of a metal ion *before* the addition of a flocculant, which aids in removing the phosphorus precipitate in Allgulin. In other words, the flocculant disclosed in Allgulin is added to a *precipitation*, not a solution to produce a flocculated mass, as recited in appellant's claims.

Accordingly, the primary reference does not suggest adding a flocculant for producing a flocculated mass, as required by appellant's claims. Without Aggulin, the rejection is improper.

#### Point 2

The Board rejected appellant's argument that Chung is not an analogous art reasoning that both Chung and Allgulin are directed to removing materials from aqueous stream with flocculating agent. The Board is submitted to overlook the following facts.

Chung discloses treatment of food wastes by a chemical treatment method that effectively removes *fat, blood, tissue and other solids* from food processing waste, using novel hydrophobical silicon-containing copolymer compositions (Abstract and column 2, lines 35-44).

Appellant sees no disclosure or suggestion that the process disclosed in Chung can be used for removing phosphorus from an aqueous stream. One skilled in the art would not consider removing phosphorus (such as phosphorus in fertilizer) and removing fat, blood, and tissue (all of which being or containing complex biological polymers) are the same or even similar.

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As such, Chung and Allgulin cannot be in the same field of endeavor because removing phosphorus and removing fat, blood, tissue, are not the same or similar. An analogy can be the removal of inorganic materials and removal of organic materials.

Nor is Chung reasonably pertinent to the particular problem with which appellant was concerned. As appellant submitted in the brief, appellant's problems disclosed in the specification include a desire to recover phosphorus from waste for use as a nutrient and avoiding the use of harmful iron and aluminum salts which may end up in the recovered phosphorus-containing flocculated mass for reasons disclosed therein.

Chung, for example, discloses in column 2, lines 16-27, the problems of concern in Chung are the polymers in the art (i.e., those disclosed in column 1, line 55 to column 2, line 15) . . . . Facing the problems of these polymers, Chung discloses a silicon-containing polyelectrolyte polymer for such use.

### Point 3

The Board first rejected appellant's argument that Chung teaches away because the appealed claims do not preclude addition of aluminum-containing chemicals. Page 6, lines 4-10. Appellant submits that the Board overlooked the claims.

First, appellant's claims 1 and 5, noted by the Board, specifically call for . . . ; (b) adding one or more metal ions selected from the group consisting of zinc and manganese ions to the stream . . . . The recitation in Markush group effectively confined the metal ions to zinc and manganese ions.

Secondly, claims are interpreted from the specification and prosecution estoppel applies. As such, appellant's claims in fact effectively preclude aluminum-containing chemicals.

The Board also rejected appellant's argument as to whether Chung teaches away from the claimed invention or from the combination with Allgulin. Appellant

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submits that the Board overlooked the fact that Chung does not disclose the combination of bentonite *and* polyacrylamide. The Board stated on page 6, lines 10-13 that Chung specifically discloses appellant's flocculants, namely, bentonite *and* polyacrylamide (emphasis appellant's).

Contrary to the Board's statement, Chung does not disclose bentonite *and* a polyacrylamide. Though Chung discloses treating a stream with a colloidal silica compound *and* a silicon-containing polymer in column 5, lines 27-53 (the coagulant, which is defined in abstract and column 2, lines 35-44, can also be used with a second coagulant which includes colloidal silica, column 5, lines 27-53), it does not so disclose for bentonite and polyacrylamide.

The Board is directed to Chung et al in column 4, lines 22-32.

The flocculant which may be used in this program may be anionic, non-ionic cationic *or* amphoteric . . . *Non-ionic* flocculants include, poly(meth)acrylamide, polyethylene oxide, *clays, bentonite*. Cationic flocculants include homo or copolymers of DMAEA or DMAEM quats with AcAm (*Italics* and *bold-type* appellant's).

It is noted that the cationic polyacrylamide and bentonite are alternative and not a combination, as the Board interpreted. That is, Chung does not suggest combining bentonite *and* a cationic polyacrylamide.

Where Chung intends to be a combination, Chung unequivocally so discloses using appropriate words such as "and combinations thereof" or "and mixtures thereof". For example, in column 2, line 64 to column 3, line 2 and column 5, lines 44-53 where Chung intends the combination of two or more chemicals, the words "and combinations thereof" or "and mixtures thereof" are used.

It can be seen that should Chung intend that polyacrylamide and bentonite be combined, Chung would and should also unequivocally so disclose. Without such disclosure, there is no suggestion or motivation provided in the Chung reference for such a suggestion.

In fact, Allgulin discloses that a *complete precipitate* of the impurities including phosphorus is formed and separated. The suggestion of the disclosure is that there is no need to add an anionic inorganic colloid and/or flocculant to precipitate the

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impurities because the impurities had already been precipitated. A further suggestion is that the colloidal silica, or flocculant, or both, should not be added because there is nothing else to be precipitated. Accordingly, Allgulin suggests that the Chung disclosure cannot or should not be combined with Allgulin.

The conclusion is that there is no suggestion, in the Chung et al disclosure, of using the combination of anionic inorganic colloid, *assuming that Chung discloses inorganic colloid, with a cationic organic polymer* because of the express word "or" disclosed.

The Board, citing *In re Kerkhoven*, then states that it is a matter of obviousness for the skilled artisan to combine two or more materials when each is taught. However, when the prior art teaches that two more materials be used separately, there is no motivation to combine them and, in fact, the art teaches away from their combination. It is, therefore, not obvious to combine two or more materials when each is taught to be alternatively used, i.e., when the prior art specifically teaches to be used separately.

#### Point 4

Concerning the evidence showing unexpected results, page 7, the Board agreed with the examiner because there is no recitation of process parameters.

First, it is obvious to one skilled in the art, the treatment of, for example, a food processing waste is at the ambient condition of the food processing itself where conditions change from one processing to another. Adding a temperature condition would be superfluous and is unnecessary. Secondly, appellant submits that the Board overlooked the specific recitations in the claims.

For example, claim 1 recites pH at least 7; metal ion is present in the range of from about 0.01 to about 10,000 ppm; and organic polymer at about 0.01 to about 10,000 ppm. Claim 25 recite pH at least 7; metal ion present in the range of from about 0.01 to about 10,000 ppm; and inorganic colloid and anionic organic polymer at 0.01 to 10,000 ppm. Other claims also recite process parameters.

The Board then stated that, (because) Allgulin expressly teaches flocculating an aqueous stream that has been treated with zinc ions in order to remove phosphorus therefrom, the unexpected results are express results of obviousness.

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Appellant submits that the Board misapprehended appellant's results and overlooked the fact that appellant showed that addition of zinc ion, contrary to Allgulin disclosure, **does not flocculate phosphorus**. Appreciable precipitation or flocculation did not take place until appellant further added a recited polymer. This may be interpreted as either appellant's process differs from that disclosed in Allgulin or the Allgulin disclosure is not enabling. Either interpretation supports the nonobviousness of appellant's claims.

At least for these reasons, appellant requests that appellant's evidence in the file be re-examined by the Board.

#### Point 5

The Board rejected appellant's argument that appellant did not demonstrate the process steps of Allgulin and Chung not recited in the claims would materially affect the basic process of removing phosphorus from an aqueous stream.

In fact, appellant did.

In the brief, page 13, appellant illustrates the steps disclosed in Allgulin. On page 14, first paragraph, appellant specifically demonstrates that two pH adjustments required in Allgulin would certainly affect the precipitation of phosphorus, as one skilled in the art would have possessed the knowledge. Allgulin also requires the formation of insoluble hydroxide that would also materially affect the removal of phosphorus. Chung also requires the step of treating a waste with a silicon-containing polyelectrolyte coagulant. These steps that would materially affect the claimed process are excluded from claims 25-33.

#### Point 6

On page 9, the Board states that because Ayukawa as well as other prior art discloses that it is known to use polymer *to remove precipitate from aqueous stream* (emphasis appellant's). Appellant does not dispute such statement. However, the Board overlooked the fact that appellant's claims are directed to using polymer(s) to produce, *not to remove*, a precipitate. See, e.g., claims 1 and 5 illustrated in Point 1.

Appellant submits that the Board also overlooked the fact that Ayukawa discloses *coagulating and precipitating* suspended substances and colloidal dispersed particles using an aqueous solution of  $ZrOCl_2 \cdot 8H_2O$ . See Abstract and



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where the examiner cited, especially column 3, lines 54-64. Such disclosure, *precipitating and flocculating a colloidal and non-colloidal substance by a zirconium salt*, goes against, or is contrary to, the claimed invention because the invention recites adding titanium ions or zirconium ions or both and an organic polymer to the stream (claim 15 and claims dependent therefrom), and further an anionic inorganic colloid (claim 22) to produce a flocculated mass.

If colloidal material is precipitated or chelated by the addition of Zr ions as disclosed in Ayukawa, it is obvious that addition of an inorganic colloid, as recited in appellant's claims, would be precipitated by the Zr ions and the colloid is rendered useless. It is therefore very illogical to suggest the need of adding an organic polymer to the precipitates or chelates.

That is, Ayukawa does not suggest the claimed invention but suggests that the invention claims would not be successful. Appellant requests the Board to reconsider its decision.

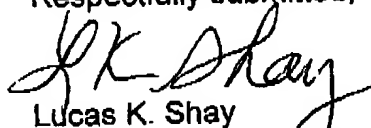
Monick et al discloses a treatment composition for removing heavy metals from wastewater using activated montmorillonite; bentonite; one or more flocculants; an alkali metal or alkaline earth metal carbonate; and a catalyst comprising zirconium and at least one polyelectrolyte. See, e.g., column 2, lines 16-22. Regardless the Board's view on the term "catalyst", appellant submits that the colloids, e.g., montmorillonite and bentonite, are precipitated by Zr ions, as disclosed in Ayukawa. Once precipitated, a precipitate does not react with any other particles or suspension (such as phosphorus-containing material) in the stream, which are away from the precipitate. It not known that a precipitate in the bottom of a stream can react with a material elsewhere in the stream without contact.

The only conclusion appellant made is that Ayukawa and Monick are exclusive, are contradictory to each other, the references themselves suggest that these two references cannot be combined, and, in fact, both suggest against their combination for a 103 rejection.

CONCLUSION

Appellant submits that the Board overlooked at least the points discussed above and misapprehended some of appellant's claims. At least for these reasons, appellant requests the Board to reconsider its decision.

Respectfully submitted,



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